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SURVNET User's Manual

By

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SURVNET is a connection-oriented survivable local-area communication network, allowing users at different locations on the network to communicate with each other. This manual provides information for using SURVNET, from assembling the system to invoking the user-level capabilities provided by SURVNET.

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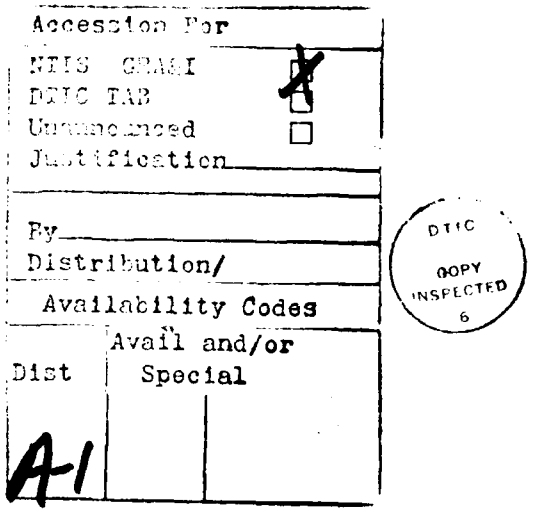

TABLE OF CONTENTS

SECTION PAGE

Appendixes

SECTION 1

GETTING STARTED

USING THIS MANUAL

To become familiar with the networking capabilities provided by SURVNET, it is advisable to first read sections one through eight. This will give you a general idea of the communication and information facilities SURVNET supports. To get an idea of what an actual SURVNET dialogue looks like, refer to appendix E, a sample SURVNET dialogue. Appendix E also outlines the general procedure for beginning a SURVNET session. Appendix C lists each SURVNET command in detail, and should be used as a command reference for specific SURVNET operations. For those of you who must assemble SURVNET, appendix A provides step-by-step instructions for configuring the system. Appendix B describes how to set up terminals for use with SURVNET. All response text is listed and described in appendix D. This information is useful for writing interfaces to SURVNET.

NOTATION

The following notational conventions are used throughout the manual to illustrate SURVNET sample dialogues.

bold italics	text that is boldy italicized represents text entered at the keyboard by a user that is not visible on the user's terminal screen
bold	text that is printed in bold letters represents text entered at the keyboard by a user that is visible on the user's terminal screen
plaintext	plaintext in sample dialogues with SURVNET represents SURVNET response text issued by the network interface processor (NIP)
{ }	braces are used primarily in command examples and indicate that an instance of the category described within the braces should be inserted
/* */	text enclosed within slashes and asterisks are comments
<CR>	indicates a carriage return
Ctrl-{keystroke}	represents the combination of the Ctrl key and another key being pressed simultaneously
SURVNET>	the SURVNET command prompt

1.1 OVERVIEW

SURVNET is a connection-oriented survivable local-area communication network, allowing users at different locations on the network to communicate with each other. A connection-oriented network allows a user to communicate with only one other network user at a time. A **connection** is the term for a communication line between two users on a network, established by request of the users. SURVNET provides a virtual circuit of connections, enabling any user of SURVNET to connect to any other user of SURVNET. Each SURVNET user is situated at a unique SURVNET address. A **SURVNET address** is a specific port at a specific node of SURVNET. A SURVNET **node** is represented by a network interface processor (**NIP**), a processing box connected to the physical cable uniting all the nodes of SURVNET. SURVNET supports seven nodes, numbered one to seven. Each NIP provides eight access ports to SURVNET. A **port** is a socket, located at the rear of the NIP, allowing data to flow in and out of the NIP. A host computer or a terminal may be connected to a port. Users of SURVNET sit at terminals connected directly to a NIP's port, or indirectly through a host computer. NIPs are the intelligent components of SURVNET. A NIP serves the requests of all users connected to its ports, and channels data received from the network to the correct user. User-bound data flows from the network cable into the NIP, and out of one of the NIP's ports to a user. Network-bound data flows from a user into a NIP's port, and out of the NIP into the network cable. Users may communicate with other users on SURVNET and login to, and use the facilities of, host computers on SURVNET.

1.2 SET-UP OF THE TERMINALS

Before attempting to use SURVNET it is important to verify that the terminals are set up properly to work with the SURVNET system. A detailed example set-up specification for VT220 terminals is included in appendix A. If the terminal you are using has not been set up for SURVNET yet, or the terminal is not behaving properly, this specification should be consulted.

1.3 SYSTEM CONFIGURATION AND BOOT-UP

Appendix A provides an illustrated guide to configuring the system. In addition to proper system configuration, the terminals must also be connected properly to the SURVNET NIPs. The terminals should be connected to a port on the rear of the NIP via an RS-232 cable, with or without a null modem inserted (see appendix A.2.4). The eight serial port connections, located at the back of the NIP, are labeled zero to seven. Once the terminals have been connected properly to the NIP, the system may be booted up. This is done by powering on the NIP by switching the on/off switch located at the front of the NIP to on. When the NIP has successfully completed its boot sequence a '[Welcome to SURVNET]' message will appear on all the terminal screens connected to the NIP.

SECTION 2

USING THE SYSTEM

2.1 DATA AND COMMAND MODES

The user may type text in one of two modes, data or command. Data mode is in effect unless specified otherwise by the user.

Command mode is used to instruct the NIP that the following text is to be interpreted as a command to execute. A *Ctrl-a* must precede every command, with a carriage return marking the end of the command. After issuing one command, the user is automatically returned to data mode. See appendix C for a complete list and description of the valid commands.

Data mode is used to transparently transport data through the NIP to the other user on a connection. Thus, it is only useful when a connection has already been established.

2.2 MAKING COMMAND ENTRY VISIBLE TO THE USER

In order to view keystrokes on the screen of a terminal connected directly to a NIP, it is necessary to enable local echo of command entry. This is done by entering the **e** command followed by a carriage return. Now whenever a *Ctrl-a* is entered by the user, the 'SURVNET>' prompt will appear on the screen. This is the command prompt, signaling the user to type in a command followed by a carriage return. If local echo is not enabled, the commands will still be sent to the NIP but the user will not be able to see what has been typed.

2.3 EDITING A COMMAND ENTRY

If the user detects a mistake in typing a command before hitting a carriage return, the error may be corrected by using the delete key on the keyboard to delete one character at a time, or starting the command over again by typing a *Ctrl-u*.

SECTION 3

USER CONTROL OF ENVIRONMENT

3.1 ALIASING A COMMAND SEQUENCE

A complete command sequence (i.e., a command with its arguments) may be given a single text word alias by using the **alias** command. Any aliases made at a port of a given node are available to all other ports at that node. The user may obtain information on a single command sequence alias, as well as a listing of all current aliases, by using variations of the **alias** command. An alias may be removed by using the **unalias** command. Aliases remain intact even through powering the NIP on and off. See appendix C.4 for a detailed description of **alias** and **unalias**.

3.2 USEFUL ALIASES

Aliases are meant to make entering and remembering commands easier for the user. Some useful command sequences to alias are **connect** commands to specific addresses and who commands on specific nodes. An alias may also be made to abbreviate long commands that take no arguments, such as the **disconnect** command.

3.3 NAMING A SURVNET ADDRESS

A user may associate a single text word name with his SURVNET address (see appendix C.2 for more on SURVNET addresses) by using the **name** command. This name will be displayed with the user's port number when the **who** command is executed on the user's node number. A name ***may not*** be substituted for a formal SURVNET address specification in a command sequence. A name may be removed by issuing the **name** command with no argument.

SECTION 4

THE STATE OF A SURVNET PORT

At any given time, every SURVNET port is in one of five states. These states are closed, waiting, connecting, established, and disconnecting. The set of SURVNET commands that a user may execute is dependent upon the state of his port. The execution of a command may also cause a port state transition. Appendix C.4 lists the legal port states for each command, as well as the resulting port state after execution of the command.

4.1 CLOSED

The port is not sustaining a connection and is closed to connection requests from others. This is a non-communicative state and is the default state upon powering up.

4.2 WAITING

The port is passively waiting for a connection to be established.

4.3 CONNECTING

The port is in the process of establishing a connection.

4.4 ESTABLISHED

The port has an established connection.

4.5 DISCONNECTING

The port is in the process of closing a connection.

SECTION 5

GETTING CONNECTION STATUS AND ID INFORMATION

5.1 USER CONNECTION ID AND STATUS INFO

The **state** command displays the state of your port and the **whoami** command displays the full SURVNET address of your port, as well as the port's name.

5.2 STATUS AND ID INFO OF OTHER SURVNET ADDRESSES

The state of all ports at a node may be listed by issuing the **who** command with the desired node's number. The nodes are numbered one through seven. The state of all the addresses on SURVNET may be acquired by performing this command on all seven nodes of SURVNET. In addition, the **who** command lists the associated name of each named port at the node.

SECTION 6

ESTABLISHING A CONNECTION

A user may either actively establish a connection to a specific SURVNET address or may passively wait for another SURVNET user to initiate the connection establishment. A user may actively establish a connection with host computers as well as users. Once the user has established a connection, actively or passively, the user may communicate with the other end of the connection by typing in text mode. A user may not attempt to establish a connection with another user, passively or actively, before closing an already established connection.

6.1 PASSIVE

To passively wait for a connection establish request, a user must issue the **wait** command. Now if another user tries to actively connect to this user's address on SURVNET, the connection request will be granted.

6.2 ACTIVE

To actively request a connection with a certain address on SURVNET, the user must issue the **connect** command with the full address (e.g., 22:1) of the other user. The connection request will succeed only if the port at the specified address is passively waiting for a connection to be established. For the syntax of a SURVNET address specification see appendix C.2.

6.3 LOGGING INTO A HOST COMPUTER THROUGH SURVNET

A user may login to any SURVNET host computer that he has an account on, by actively establishing a connection to one of the SURVNET addresses dedicated to the host computer (a host computer will typically have several dedicated ports to SURVNET). Once the connection has been established, follow the host computer's login procedure. If command entry is doubly echoed, enter the **unecho** command to disable local echo of command entry. The user should always logout of a host computer before closing the connection with the host.

6.4 WHEN A CONNECTION IS UNABLE TO BE ESTABLISHED

A connection can fail to be actively established for several reasons. The SURVNET node you wish to connect to may not be alive, the SURVNET node may be alive, but the port may not be currently waiting for a connection to be established, or the connect request may not be reaching the destination address. The user can tell if the port is in the wait state by using the **who** command on the port's node. If the node is not alive, or communication to this SURVNET address is blocked, nothing will be displayed. If information for the node is

returned and the port is in the wait state, the user should try to establish the connection again. If data transmission is not reaching the desired node, there is nothing the user can do within the facilities of SURVNET. In this case other means must be used to determine why data is not getting sent through the network.

6.5 NOTIFICATION OF CONNECTION ATTEMPTS

If other SURVNET users attempt to establish a connection to a user on a port that is not passively awaiting connection establishment, the user will be notified of the connection attempt with a '[Connect Attempt from {the SURVNET address of the user requesting the connection}]' message.

SECTION 7

CLOSING A CONNECTION

A connection may be closed in several ways.

7.1 GRACEFUL

The user may gracefully close a connection, ensuring that all data just typed by either user on the connection is delivered to the other user, by issuing the **disconnect** command. Both sides of a connection are closed when the connection is closed in this manner. The **disconnect** command may only be used when the user's port is in a connection established state. After closing the connection, the **disconnect** command leaves both ports in the wait state.

7.2 UNGRACEFUL

A connection may be aborted by issuing either the **cancel** or **reset** commands. The **cancel** command may not be used when the user's port is in a connection closed state. The **reset** command may be used in any state. Both commands put the port in the closed state. The **reset** command leaves the port in the closed state, while the **cancel** command returns the port to the wait state.

7.3 TERMINATION

The NIP will terminate a connection whose data transfer rate has degraded below a certain level. The user will be notified of connection termination with a '[Connection Terminated]' message.

SECTION 8

AUTOMATIC SYSTEM RESTART

When an irrecoverable state is detected within a NIP, the NIP performs an automatic re-initialization. All connections previously sustained by the NIP are lost and all the NIP's ports are reset to the wait state. The '[Welcome to SURVNET]' message is issued to all ports at the NIP when re-initialization is complete.

APPENDIX A

ASSEMBLING SURVNET

A.1 SURVNET HARDWARE

A.1.1 SURVNET Components

Network Interface Processors (NIPs)
Bus Isolation Devices (BIDs)
Optical Modems (OMs)

A.1.2 SURVNET Cables

RS-232C with DB-25 connectors (RS-232C/DB-25)
Ethernet with DB-15 connectors (Ethernet/DB-15)
Fibre Optic Cables
Power Cords

A.1.3 SURVNET Accessories

Null modems
Female to female RS-232C adaptor cables with DB-25 connectors
Washers for fibre optic receivers (regular washers)
Delrin sleeves for fibre optic connector ferrels (small red rubber tubes)
Fuses

A.2 PRELIMINARY ASSEMBLY INFORMATION WARNING - IMPORTANT READ THIS SECTION FIRST

A.2.1 Voltage Settings

Before attempting to configure the system, ***make sure that the voltage selectors on the NIPs, BIDs, and special bypass OMs are consistent with the power source being used.*** Failure to do so could short out the system. If a volt selector panel displays the incorrect voltage, change the volt setting by unscrewing the panel, switching the center switch to the opposite setting, and replacing the selector panel so that the correct volt setting is displayed. Europe uses 230 VAC, while America uses 115 VAC.

A.2.2 Fuses

The following types of fuses must be used with all NIPs:

AC OUT	3AG 3AMP
FANS	3AG 1AMP

AC IN 3AG 3AMP SLO BLO

All BIDS require 3AG 3AMP fuses. Spare fuses are stored on the bottom of all SURVNET node carrying cases.

A.2.3 Fibre Optic Advisory

Each fibre optic cable consists of two separate fibre optic threads. One of these threads is labelled every foot, while the other one is not. Make sure that each individual thread is connected to the fibre optic receiver of an OM on one end, and the fibre optic transmitter of an OM on the other end.

If an optical transceiver problem is suspected (i.e., data is not being received through the cables), try inserting or removing the washers on the two receive fibre optic connectors of each optical modem.

When connecting and disconnecting fibre optic cables to and from the optical modems be careful that the delrin sleeves located within the connector ferrels are not displaced from their position at tne innermost end of the ferrel. If a sleeve is disturbed, the sleeve should be replaced with a new delrin sleeve. Insert the new delrin sleeve into the connector ferrel widest end first. Push the sleeve back into position using the metal nose of a fibre optic cable.

Whenever a fibre optic cable is not connected to a connector ferrel on an OM, be sure that the ferrel's anti-dust cap is screwed on.

A.2.4 The Use of Null Modems in Connecting to User Ports on NIP

When connecting a terminal, modem, or host computer to one of a NIP's user ports, it may be necessary to insert a null modem to the RS-232C/DB-25 cable connecting the two. The RS-232C cable is a standard interface between user's data terminal equipment (DTE), and data circuit-terminating equipment (DCE). A null modem acts as a converter when the standard DTE/DCE interface configuration is not in use. Since terminals and computers often differ in their adherence to the DTE/DCE standard, it is necessary to determine if each component type requires a null modem via experimentation. The component will only communicate with the NIP when connected with the correct cable configuration.

A.3 CONFIGURING A SINGLY-CONNECTED NODE

A singly-connected node requires one NIP, one BID, one OM, three Ethernet/DB-15 cables, eight RS-232C/DB-25 cables, and two power cords. Refer to figure A-4.

1) If the node connection selector panel on rear of NIP reads DOUBLE, change the selection to SINGLE. Unscrew the panel, switch the center switch to the opposite setting, and replace the selector panel so that SINGLE is displayed on the panel.

2) Connect primary channel on NIP to PRI/SEC channel on BID with an Ethernet/DB-15 cable.

3) Connect AC OUT on NIP to AC IN on BID with power cable.

4) Connect channel 1 of BID to channel 1 of the OM with an Ethernet/DB-15 cable.

5) Connect channel 2 of BID to channel 2 of the OM with an Ethernet/DB-15 cable.

6) Connect AC IN on NIP to power source.

7) Connect terminals or host computers to user ports of NIPs with RS-232C/DB-25 cables. Use null modems as required (see A.2.4).

A.4 CONFIGURING A DOUBLY-CONNECTED NODE

A doubly-connected node requires one NIP, two BIDs, two OMs, six Ethernet/DB-15 cables, eight RS-232C/DB-25 cables, and three power cords. A node employing the special bypass OMs requires an additional power cord. Refer to figures A-5 and A-6.

1) If the node connection selector panel on rear of NIP reads SINGLE, change the selection to DOUBLE. Unscrew the panel, switch the center switch to the opposite setting, replace the selector panel so that DOUBLE is displayed on the panel.

2) Connect primary channel on NIP to the primary BID's PRI/SEC channel with an Ethernet/DB-15 cable.

3) Connect secondary channel on NIP to the secondary BID's PRI/SEC channel with an Ethernet/DB-15 cable.

4) Connect the primary BID to the primary OM as described in Steps 4 and 5 of the Singly-Connected Node description.

5) Connect the secondary BID to the secondary OM as described in Steps 4 and 5 of the Singly-Connected Node description.

6) **Note:** If the OMs in the chassis are the two special ones containing bypass switches, go to Step 6b now. Otherwise perform Step 6a.

a) Connect AC OUT of NIP to AC IN of primary BID with a power cord. Connect AC OUT of primary BID to AC IN of secondary BID.
Go to Step 7.

b) Connect AC OUT of NIP to power strip located on inside top edge of rear of chassis with long power cord.
Connect AC IN of each of two BIDs to a socket of the power strip described above using a short power cord.
Connect AC OUT of each of the two BIDs to AC IN of the OM located below the BID.
Go to Step 7.

7) Connect AC IN on NIP to power source.

8) Connect terminals or host computers to user ports of NIPs with RS-232C/DB-25 cables. Use null modems as required (see A.2.4).

A.5 CONNECTING TWO NODES

the two fibre optic threads of the fibre optic cable to the transmit and receive fibre optic connector ferrels of node a's OM channel one. Connect the other end of the cable to node b's OM channel two fibre optic receive and transmit connector ferrels. Make sure each fibre optic thread goes from a transmit connector to a receive connector on the OMs as described in A.2.3.

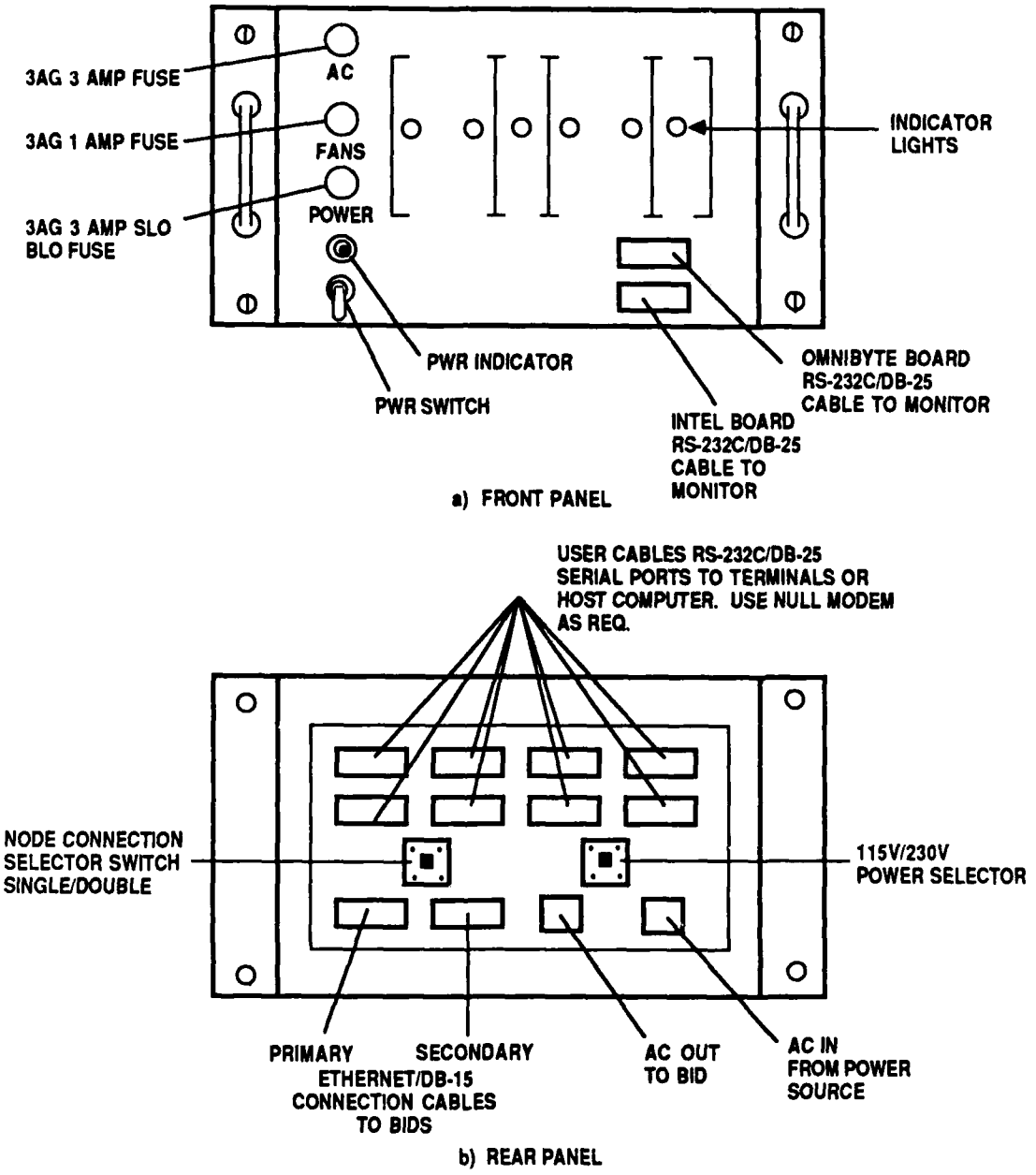

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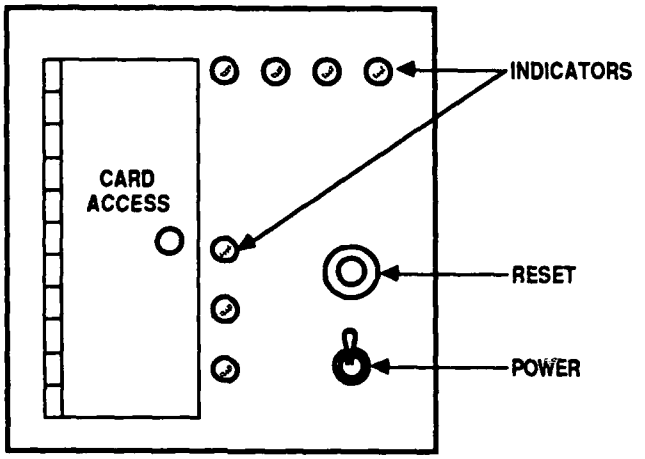
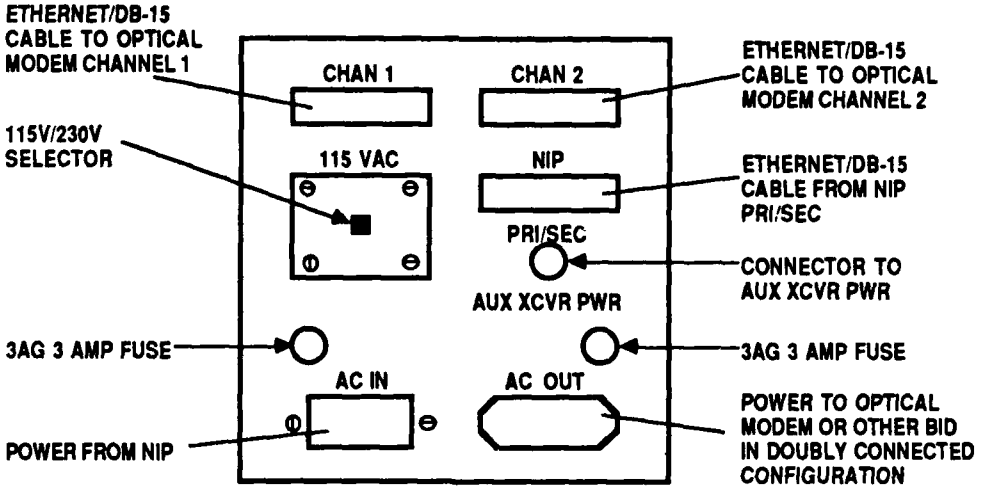
Figure A-1. NETWORK INTERFACE PROCESSOR



a) FRONT PANEL



b) REAR PANEL

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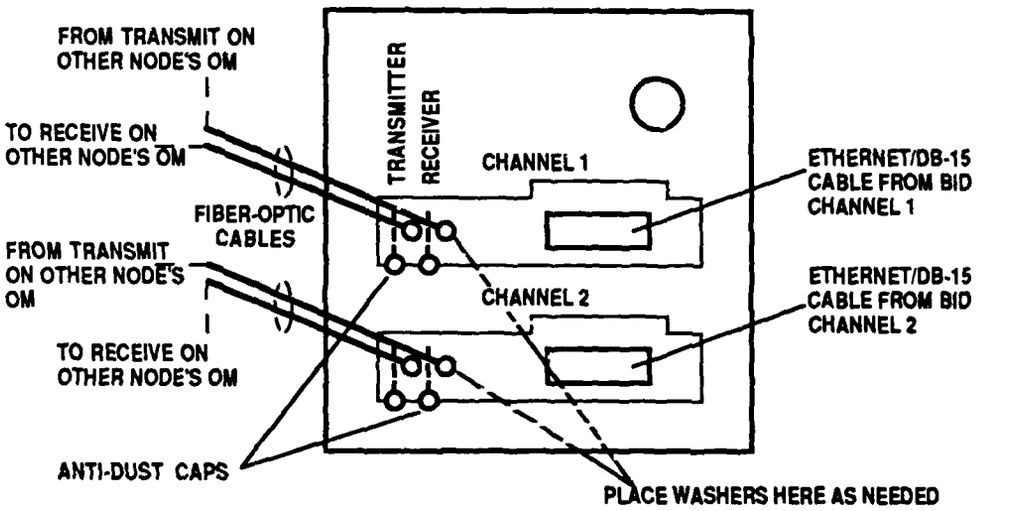
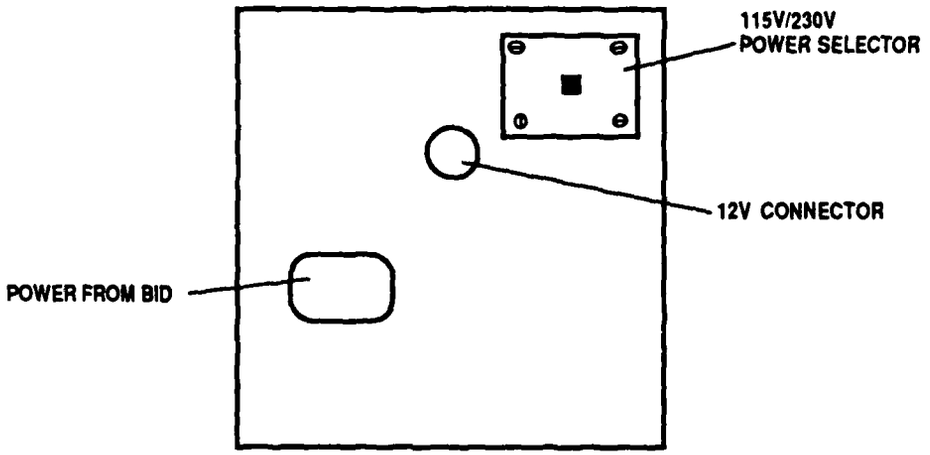
Figure A-2. BUS ISOLATION DEVICE



a) FRONT PANEL



NOTE: BACK PANEL NOT ON ALL MODEMS

b) REAR PANEL

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Figure A-3. OPTICAL MODEM

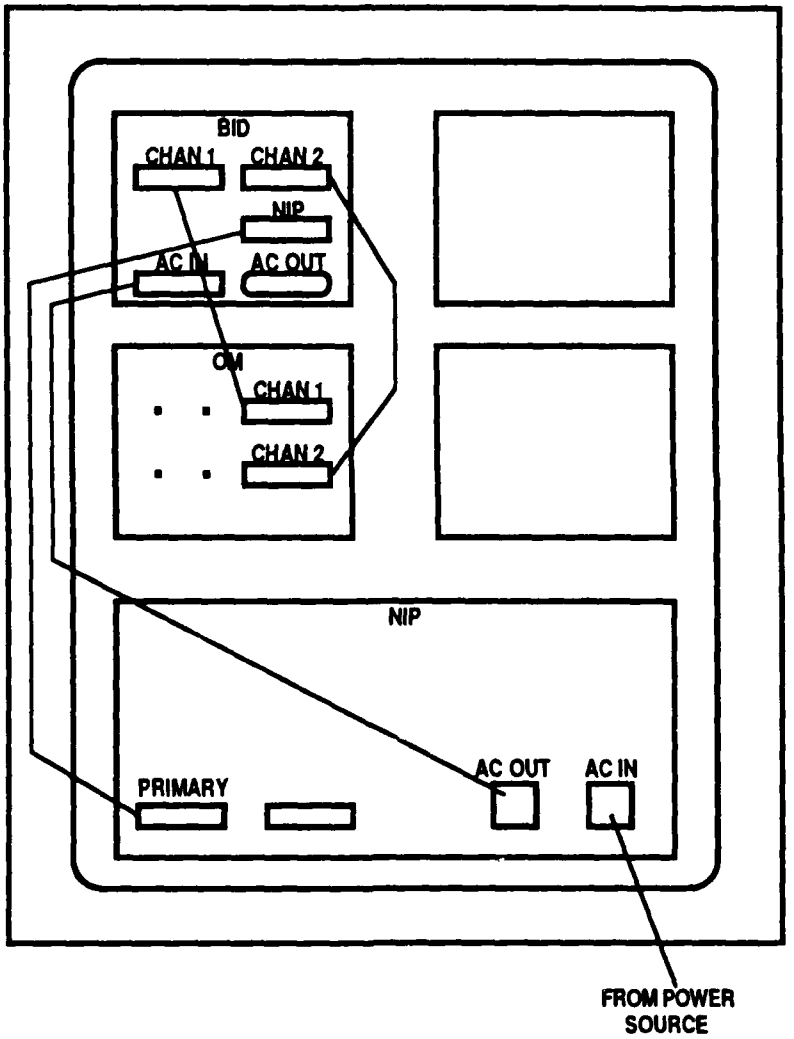

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Figure A-4. REAR VIEW OF SINGLY-CONNECTED NODE CHASSIS

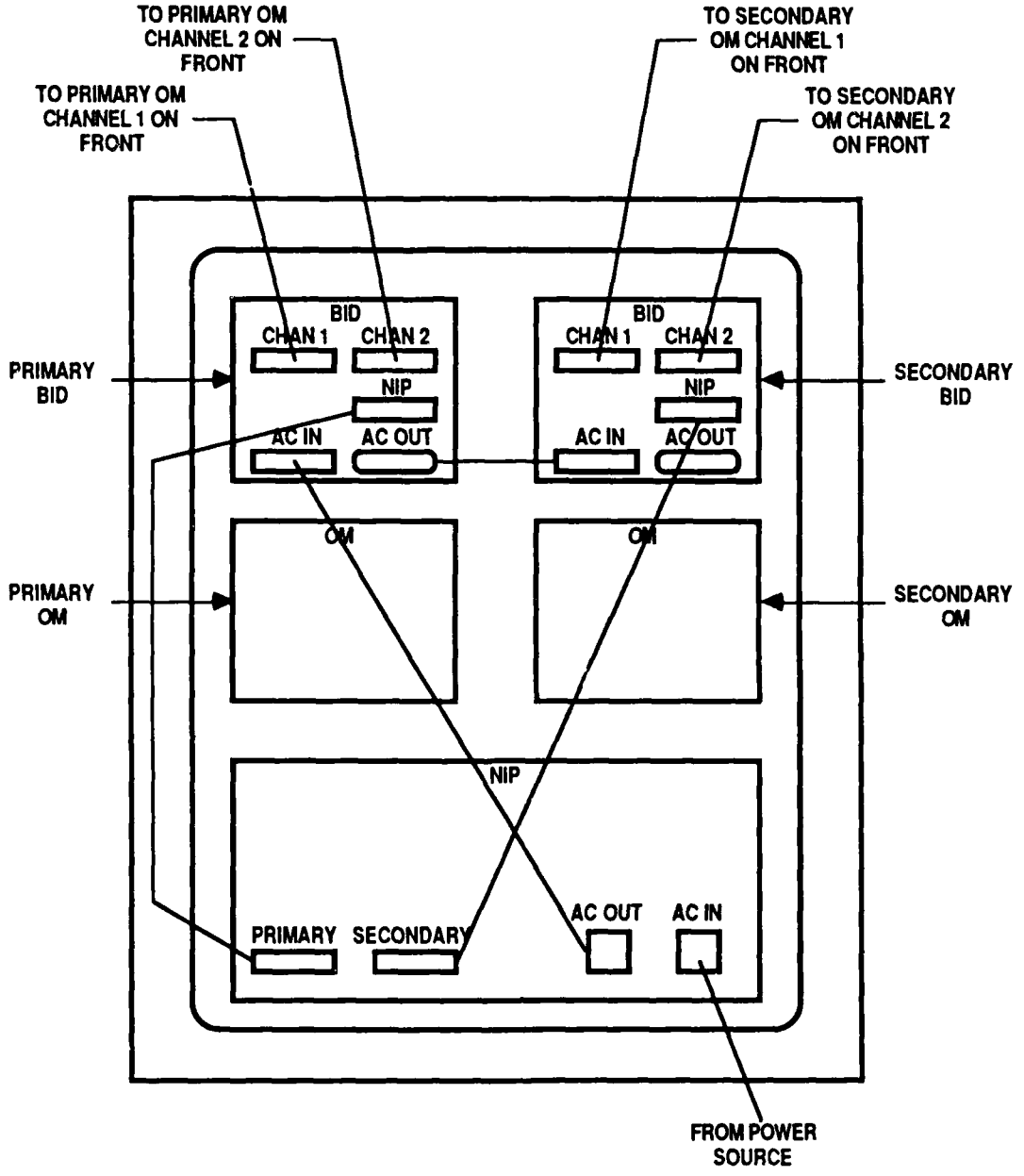

Figure A-5. REAR VIEW OF DOUBLY-CONNECTED NODE CHASSIS WITH STANDARD OM's

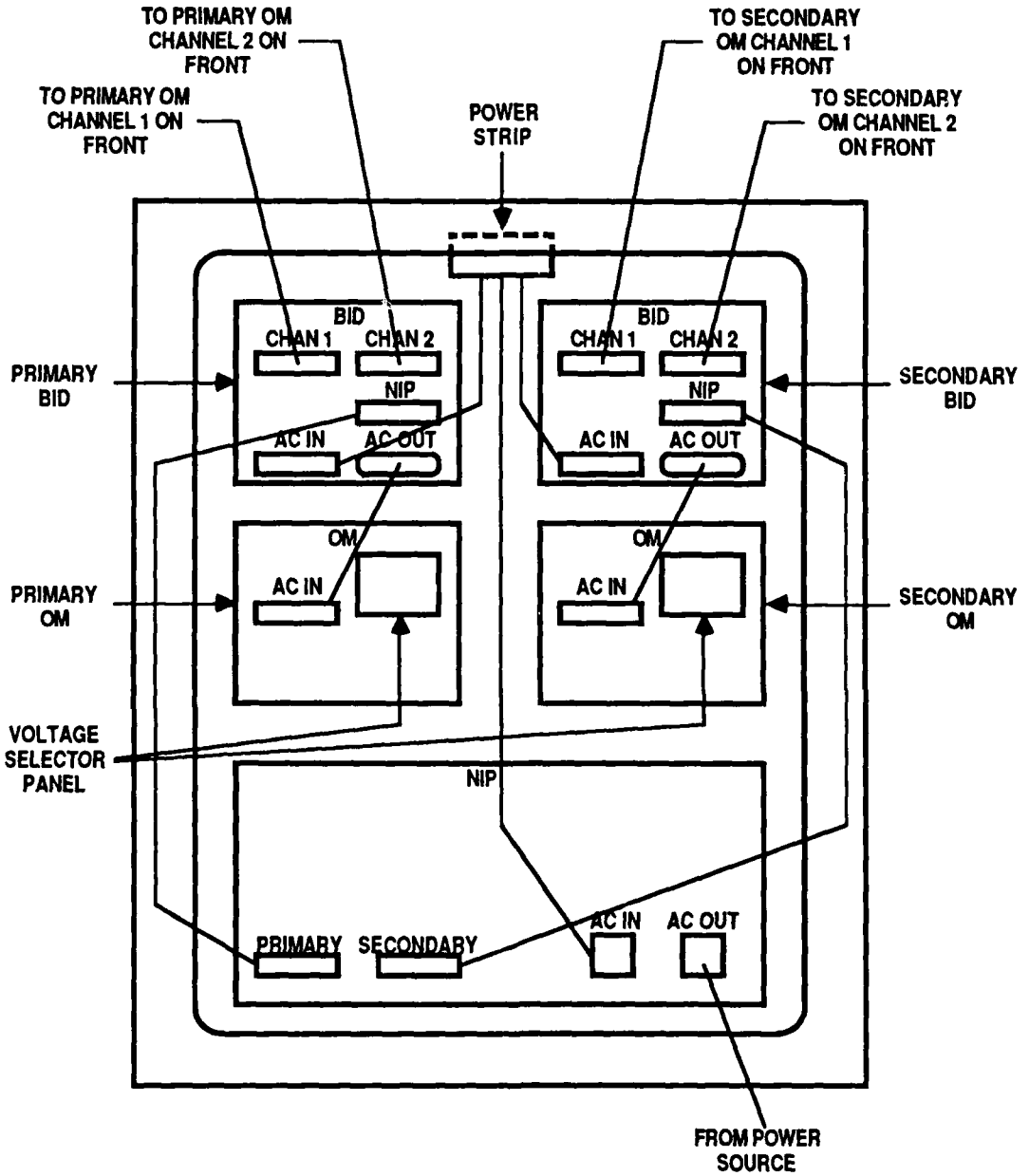

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Figure A-6. REAR VIEW OF DOUBLY-CONNECTED NODE CHASSIS WITH SPECIAL BYPASS OMs

APPENDIX B

VT220 TERMINAL SET-UP FOR SURVNET

This is a specification for the set-up of VT220 terminals for use with the SURVNET system. It may be used as a guide for setting up non-VT220 terminals as well. The set-up on VT220s may be viewed and altered by hitting the set-up key (F3) on the keyboard. The following display will appear.

Set-Up Directory VT220 VT220 V2.1
Display General Comm Printer Keyboard Tab
On Line Clear Display Clear Comm Reset Terminal Recall Save
Set-Up English North American Keyboard Default Exit

This is a menu of the different set-up categories available. In order to go to one of these set-up categories, you must move the cursor to the desired category by using the arrow keys on the keyboard. Hit the enter key when the cursor is on the desired option and a display for this category will appear. To change an option in a set-up, simply move the cursor to the option you wish to change, as described above, and hit the enter key until the option is set correctly. This is the way the different displays should look for SURVNET. Only the important set-up options of each display are listed.

Display Set-Up VT220 V2.1
..... Interpret Controls
.... Jump Scroll
Cursor .....

General Set-Up VT220 V2.1
..... VT100 Mode
....
..... No New Line

Communication Set-Up VT220 V2.1
..... Transmit=9600 Receive=Transmit
No XOFF 7 Bits, Space Parity 1 Stop Bit No Local Echo
EIA Port, Data Leads Only Disconnect, 2 s Delay Limited Transmit

Keyboard Set-Up VT220 V2.1
.....
..... No Break
.....

APPENDIX C

SURVNET COMMAND SUMMARY

C.1 SYNTAX

All commands must be in lowercase and may not be abbreviated. All command argument characters must be alphabetic or numeric. Non-alphabetic or non-numeric characters in a command sequence delimit words but are otherwise disregarded.

C.2 SURVNET ADDRESS SPECIFICATION

A SURVNET address is a port at a node on SURVNET. When specifying a SURVNET address in a command, the following syntax should be followed:

{node number}{node number}:{port number}

where the node number is an integer in the range of one to seven, and port number is an integer in the range of zero to seven. Example of a request to connect to node 1, port 0:

connect 11: 0

C.3 GENERAL COMMAND FORMAT

A command is issued by entering:

Ctrl-a {command sequence} <CR>

C.4 COMMAND LISTING

Each command entry below includes the syntax for the command, the port states that the command may be issued in, the function of the command, and the port state that results from executing the command. If a command does not cause a port state transition, 'no change' is entered in the resulting port state section for that command.

noecho

syntax:	noecho
legal port states:	all states
function:	Disable local echo in the NIP of characters typed in command mode.
resulting port state:	no change
example:	***Ctrl-a*** SURVNET> **noecho <CR>** [Echo Disabled] ***Ctrl-a e*** **<CR>** [Echo Enabled] ***Ctrl-a*** SURVNET> /* command is visible */

e

syntax:	**e**
legal port states:	all states
function:	Enable local echo in the NIP of characters typed in command mode.
resulting port state:	no change
example:	see example above

state

syntax:	state
legal port states:	all states
function:	Display the state of the port from which the command was issued.
resulting port state:	no change
example:	***Ctrl-a*** SURVNET> **state <CR>** [State is ESTAB]

whoami

syntax:	whoami
legal port states:	all states
function:	Display the SURVNET address and the associated name, if any, of the port from which the command was issued.
resulting port state:	no change
example:	***Ctrl-a*** SURVNET> **whoami <CR>** [{node number}{node number}:{port number}/{port's name}]

who

syntax: who {node number}{node number}
note: braces are not entered

legal port states: all states

function: Display the state of all ports at the node specified, with their associated name, if any.

resulting port state: no change

example:

Ctrl-a
SURVNET> **who 11 <CR>**
< 0/{state of port 0}/{port 0's name} >
< 1/{state of port 1}/{port 1's name} >
.....
< 7/{state of port 7}/{port 7's name} >

name

syntax: name {single textword}
note: braces are not entered

legal port states: all states

function: Associate a textword with the SURVNET address of the port from which the command was issued. The name command overrides any previous name associated with this port. Issuing the name command with no argument erases an established name.

resulting port state: no change

example:

Ctrl-a
SURVNET> **whoami <CR>**
[11:0/]
Ctrl-a
SURVNET> **name Peter <CR>**
[Name Established]
Ctrl-a
SURVNET> **whoami <CR>**
[11:0/Peter]
Ctrl-a
SURVNET> ***name Joe <CR>***
Ctrl-a
SURVNET> **whoami <CR>**
[11:0/Joe]
Ctrl-a
SURVNET> **name <CR>**
[Name Joe Removed]

alias Alias may be used in three ways, depending on the number of parameters it is given.

syntax: alias {single textword} {command sequence}
note: braces are not entered
legal port states: all states
function: Alias any complete SURVNET command sequence with a textword. The textword must be comprised of upper or lowercase letters or digits, and must not exceed 48 characters in length. When this textword is entered in command mode, the aliased command sequence will be substituted for execution.
resulting port state: no change
example:

Ctrl-a
SURVNET> **alias wbdoc who 11<CR>**
[wbdoc / who 11]
Ctrl-a
SURVNET> **wbdoc <CR>**
< 0/{port state}/{port name} >
...
< 7/{port state}/{port name} >

syntax: alias {single textword}
note: braces are not entered
function: Display the command sequence that the textword is an alias for.
example:

Ctrl-a
SURVNET> **alias wbdoc <CR>**
[wbdoc / who 11]
SURVNET> **alias wbdoc state <CR>**
[wbdoc / state]
Ctrl-a
SURVNET> **alias wbdoc <CR>**
[wbdoc / state]
Ctrl-a
SURVNET> **alias wbdoc who 11<CR>**
[wbdoc / who 11]
Ctrl-a
SURVNET> **alias wbdoc <CR>**
[wbdoc / who 11]

syntax: alias
function: Display all the current command aliases at the port's **NIP**.
example:

Ctrl-a
SURVNET> **alias <CR>**
[wbdoc / who 11]

unalias

syntax:	unalias {single textword} note: braces are not entered
legal port states:	all states
function:	Unalias the textword from its aliased command sequence.
resulting port state:	no change
example:	***Ctrl-a*** SURVNET> **unalias wbdoc <CR>** [Alias Removed] ***Ctrl-a*** SURVNET> **wbdoc <CR>** [Invalid Command]

wait

syntax:	wait
legal port states:	CLOSED
function:	Put the port from which the command was issued in the WAIT state to passively await connection establishment.
resulting port state:	WAIT
example:	***Ctrl-a*** SURVNET> **state <CR>** [State is CLOSED] ***Ctrl-a*** SURVNET> **wait <CR>** [Waiting for Connection]

connect

syntax: connect {node number}{node number}:{portnumber}
note: braces are not entered

legal port states: CLOSED, WAIT

function: Attempt to actively establish a connection with the port at the SURVNET address specified.

resulting port state: If connect attempt succeeds, ESTAB
Otherwise, no change

example:

Ctrl-a
SURVNET> **state <CR>**
[State is {CLOSED or WAIT}]
Ctrl-a
SURVNET> **who 11 <CR>**
< 0/WAIT/one >
...
< 7/CLOSED/seven >
Ctrl-a
SURVNET> **connect 11:0 <CR>**
[Connection established with 11:0]

disconnect

syntax: disconnect

legal port states: ESTAB

function: Gracefully close a connection. Transfers all data already pending before closing the connection. Leaves both ports in the WAIT state.

resulting port state: WAIT

example:

Ctrl-a
SURVNET> **state <CR>**
[State is ESTAB]
Ctrl-a
SURVNET> **disconnect <CR>**
[Connection Closed]
[Waiting for Connection]
Ctrl-a
SURVNET> **state <CR>**
[State is WAIT]

cancel

syntax:	cancel
legal port states:	CONN, WAIT, ESTAB, DISC
function:	Close a connection immediately by putting theconnection in the CLOSED state regardless of pending data on the connection. Leaves the port in the WAIT state.
resulting port state:	WAIT
example:	**Ctrl-a** SURVNET> **state <CR>** [State is ESTAB] **Ctrl-a** SURVNET> **cancel <CR>** [State is WAIT]

reset

syntax:	reset
legal port states:	all states
function:	Unconditionally close a connection regardless of port state, or any pending data on the connection. After putting the port in the CLOSED state, local echo in the NIP is disabled for this port.
resulting port state:	CLOSED
example:	**Ctrl-a** SURVNET> **state <CR>** [State is CLOSED] **Ctrl-a** SURVNET> **reset <CR>** [Echo Disabled] **Ctrl-a state <CR>** [State is CLOSED]

APPENDIX D

SURVNET RESPONSE MESSAGES

D.1 USEFUL INTERFACE INFORMATION

D.1.1 Special Character Notation

XOFF	ASCII 17	Ctrl-s	DC3
XON	ASCII 19	Ctrl-q	DC1
SOH	ASCII 1	Ctrl-a	
LF	ASCII 10	Ctrl-j	
SP	ASCII 32	Space-bar	

D.1.2 Response Text Format

All SURVNET responses are sent to a port in the following manner:
SOH {response message} LF
Where a response message is of the form:
SP[SP{message}SP]SP

D.1.3 Flow Control Characters

To implement flow control, the NIP will issue the XON/XOFF(DC1/DC3) control characters.

D.2 RESPONSE MESSAGES

D.2.1 User Error Messages

[Inappropriate Command]
Issued when the user has entered a SURVNET command in an illegal port state for that command. For example, issuing a connect command when the port is already in a connection established state.

[Invalid Command]
Issued when the user has entered an undefined command.

[Missing Argument(s)]
Issued when the user has entered a SURVNET command with too few arguments.

[Too Many Arguments]
Issued when the user has entered a SURVNET command with too many arguments.

D.2.2 Command Response Text

D.2.2.1 SURVNET Addresses

{n}{n}:{p}	Address of port number p at node number n. note: braces are not entered

D.2.2.2 Port State Abbreviations

CLOSED	port is sustaining a closed connection
WAIT	port is passively waiting for connection establishment
CONN	port is in the process of establishing a connection
DISC	port is in the process of closing a connection
ESTAB	port is sustaining an established connection

D.2.2.3 Command Response Messages

[Welcome to SURVNET]
Issued when NIP has completed system initialization, at power up time or when system executes an automatic system restart upon detecting an irrecoverable error state.

[Waiting for Connection]
Issued in response to executing the **wait** command. Indicates that the port is passively awaiting connection establishment.

[Connection established with {node}{node}:{port}]
Issued when the port has established a connection, passively or actively, with the SURVNET address displayed.

[Unable to Establish Connection]
Issued when an active connection request could not be satisfied.

[Connect Attempt from {node}{node}:{port}]
Issued when a port is not waiting for a connection to be established, but someone is attempting to actively establish a connection with them.

[Connection Closed]
Issued when a port has been closed by issuing the **disconnect** or **cancel** command.

[Connection Terminated]
Issued when the NIP automatically terminates a connection because of poor transmission on the connection.

[State is {state}]
Issued in response to the **state** command.

[Echo Enabled]
Issued in response to the **e** command to indicate that local echo of command entry has been enabled in the NIP.

[Echo Disabled]
Issued in response to the **unecho** command to indicate that local echo of command entry has been disabled in the NIP.

[Name Established]
Issued in response to the **name** command to indicate that the given name has been established.

[Name {name} Removed]
Issued in response to the **name** command to indicate that the established name has been removed.

[Alias Removed]
Issued in response to the **unalias** command to indicate that the given command alias has been removed.

[No Matching Alias]
Issued in response to an **alias** command requesting a display of the command sequence a non-existing alias represents.

[{command alias} / {aliased command sequence}]
Format displayed in response to an **alias** command requesting a display of the command an existing alias represents, and to confirm that the displayed alias has been established as requested.

< {port number }/{ port state }/{port name} >
Format displayed for each port at a node in response to a **who** command issued on that node.

APPENDIX E

A TUTORIAL AND DIALOGUE WITH SURVNET

E.1 TUTORIAL

If you are unfamiliar with SURVNET, the following procedure is good to follow whenever you begin a SURVNET session. Refer to appendix C for command details.

- Enable local echo of command entry so you can view the characters you are typing in command mode by using the **e** command.

- Make sure that no one is able to interrupt you while you familiarize yourself with SURVNET and gather the necessary information to operate by putting your port in the closed state. Other users on SURVNET will be unable to correspond with you while you are in the closed state. Enter the **state** command to determine your state, and issue the **reset** command to close your port, if it is not already closed. To re-enable local echo enter the **e** command.

- Determine what your SURVNET address is, and if your address has a name, by using the **whoami** command. If your address is un-named, or you would like to give it a new name, use the **name** command.

- Check the current aliases you have available to you by entering the **alias** command with no arguments. If you would like to make your own command aliases to use, do so by using the **alias** command with the correct command alias arguments.

- Find out what nodes are up on the network and their ports' states and identities by using the **who** command on all seven nodes of SURVNET.

- If you would like to remain unopen to correspondence, stay in the closed state. If you would like to leave yourself open to correspondence, issue the **wait** command. If you would like to establish a connection with a specific user on SURVNET, issue the **connect** command with the desired user's SURVNET address.

E.2 SAMPLE DIALOGUE

This is a dialogue intended to reinforce the user's understanding of how to use the SURVNET commands. In this example, the dialogue is presented from the point of view of a person referred to as the dispatcher.

Ctrl-a e <CR>	/* Enable local echo of command entry (see 2.2)*/
Ctrl-a	
SURVNET> **whoami <CR>**	/* Identify SURVNET address and name*/
[11:0/dispatcher]	/* of this port (see 5.1) */

```
Ctrl-a
SURVNET> state <CR>                          /* Determine this port's state (see 5.1 and 4.0) */
  [ State is CLOSED ]
Ctrl-a
SURVNET> alias <CR>                          /* List defined command aliases(see 3.1)*/
  [ cbdoc/connect 22:0 ]
  [ wbdoc/who 22 ]
  [ disc/disconnect ]
Ctrl-a
SURVNET> alias crepair0 connect 33:0 <CR>    /* Define a command alias */
  [ crepair0/connect 33:0 ]                  /* (see 3.1 and 3.2) */
Ctrl-a
SURVNET> alias crepair1 connect 33:1 <CR>    /* Define a command alias */
  [ crepair1/connect 33:1 ]                  /* (see 3.1 and 3.2) */
Ctrl-a
SURVNET> alias wrepair who 33 <CR>           /* Define a command alias */
  [ wrepair/who 33 ]                         /* (see 3.1 and 3.2) */
Ctrl-a
SURVNET> alias cmedstaff connect 44:0 <CR>   /* Define a command alias */
  [ cmedstaff/connect 44:0 ]                 /* (see 3.1 and 3.2) */
Ctrl-a
SURVNET> alias <CR>                          /* List defined command aliases (see 3.1) */
  [ cbdoc/connect 22:0 ]
  [ wbdoc/who 22 ]
  [ disc/disconnect ]
  [ crepair0/connect 33:0 ]
  [ crepair1/connect 33:1 ]
  [ wrepair/who 33 ]
  [ cmedstaff/connect 44:0 ]
Ctrl-a
SURVNET> wbdoc <CR>                          /* Issue an aliased who command */
                                             /* to obtain node 22's ports' states (see 5.2) */
        < 0/ESTAB/bdoc0 >
        < 1/WAIT/bdoc1 >
        < 2/CLOSED/bdoc2 >
        < 3/DISC/bdoc3 >
        < 4/WAIT/bdoc4 >
        < 5/WAIT/bdoc5 >
        < 6/ESTAB/ bdoc6 >
        < 7/CLOSED/bdoc7 >
Ctrl-a
SURVNET> cbdoc <CR>                          /* Issue an aliased connect command to 22:0 */
  [ Unable to Establish Connection ]         /* Connection not established because 22:0 is */
                                             /* not in the WAIT state (see 6.4) */
```

```
Ctrl-a
SURVNET> connect 22:1 <CR>          /* Issue connect command to 22:1 (see 6.2) */
  [ Connection Established with 22:1 ]
Hello Jim                           /* Typed by dispatcher */
                                    /* (see 2.1 data mode description) */
[ Connect Attempt from 44:6]        /* SURVNET message indicating that */
                                    /* 44:6 is trying to connect to this port */
                                    /* (see 6.5) */
Oh, sorry, have to go. Someone's trying to talk to me.
bye                                 /* Typed by dispatcher */
Ok - talk to you later....          /* Typed by other party on the connection */
Ctrl-a
SURVNET> disconnect <CR>            /* Dispatcher closes current connection */
                                    /* (see 7.1)*/
  [ Connection Closed ]
  [ Waiting for Connection ]        /* This port is now waiting for a connection */
  [ Connection Established with 44:6 ]  /* Connect attempt from 44:6 now succeeds */
                                    /* (see 6.1) */
You called?                         /* Typed by dispatcher */
                                    /*  (see 2.1) */
Please send a med tech to mpolice headquarters right away.  /* Typed by other party */
ok                                  /* Typed by dispatcher */
Ctrl-a
SURVNET> disconnect <CR>            /* Dispatcher closes connection (see 7.1) */
  [ Connection Closed ]
  [ Waiting for Connection ]
Ctrl-a
SURVNET> cmedstaff <CR>             /* Dispatcher establishes a connection
                                    /*  with 22:1 (see 6.2) */
      [ Connection Established with 22:1 ]
Please send a medical technician to mpolice headquarters immediately.
                                    /* Typed by the dispatcher */
ok- will do                         /* Typed by other party */
bye                                 /* Typed by other party */
[ Connection Closed ]               /* Other party closes the connection */
[ Waiting for Connection ]          /* This port is left in the wait state after */
                                    /* connection is closed (see 7.1)*/
Ctrl-a
SURVNET> reset <CR>                 /* Dispatcher closes this port to */
                                    /* correspondence (see 4.1 and 7.2)*/
      [ State is CLOSED ]
```

APPENDIX F

ALPHABETIZED COMMAND INDEX

APPENDIX G

GENERAL INDEX